IN THE CLAIMS

The claims pending in the application are reproduced below in accordance with 37 C.F.R. § 1.121:

1. (original) A cooling apparatus for fuel cell components comprising:

a base plate having an upper section and a lower section;

a plurality of upper ribs and a plurality of lower ribs coupled to said upper section and said lower section, respectively, each of said plurality of upper ribs and lower ribs defining an upper serpentine channel and a lower channel formed between each of said plurality of upper ribs and lower ribs, respectively, said upper serpentine channel and said lower channel fluidically coupled by at least one cavity disposed in said base plate,

wherein said upper serpentine channel and said lower channel are disposed to allow a flow of a fluid therethrough so as to enhance the heat transfer between said fluid and said fuel cell components.

2. (original) The cooling apparatus of claim 1, wherein said fuel cell components are selected from the group consisting of cathodes, anodes and electrolytes.

3. (original) The cooling apparatus of claim 1, wherein a plurality of concavities are disposed on a surface portion of said upper serpentine channel and disposed on a surface portion of said lower channel so as to cause hydrodynamic interactions and affect the heat transfer rate between said fluid and said concavities when said fluid is disposed over said concavities.

4. (original) The cooling apparatus of claim 3, wherein said concavities are selected from the group consisting of depressions, indentations, dimples and pits.

5. (original) The cooling apparatus of claim 1, wherein said fluid is selected from the group consisting of gaseous fuels and oxidants.

6. (currently amended) The cooling apparatus of claim 1, wherein said cooling apparatus comprises one of a thin-formed metal, stainless steel, cobaltite, ceramic, LaCrO3, CoCrO4, ~~Inconel 600, Inconel 601, Hastelloy X, Hastelloy 230~~ an alloy comprising nickel and chromium, an alloy comprising nickel and cobalt, ~~and~~ or combinations thereof.

7. (original) A fuel cell assembly comprising:

at least one fuel cell having at least two electrodes and an electrolyte disposed therebetween;

at least one cooling apparatus coupled to at least one of said electrodes, said cooling apparatus comprising:

a base plate having an upper section and a lower section;

a plurality of upper ribs and a plurality of lower ribs disposed over said upper section and said lower section, respectively, each of said plurality of upper ribs and lower ribs defining an upper serpentine channel and a lower channel formed between each of said plurality of upper ribs and lower ribs, respectively, said upper serpentine channel and said lower channel fluidically coupled by at least one cavity disposed in said base plate,

wherein said upper serpentine channel and said lower channel are disposed to allow a flow of a fluid therethrough so as to enhance the heat transfer between said fluid and said fuel cell.

8. (original) The fuel cell assembly of claim 7, wherein said fuel cell is selected from the group consisting of solid oxide fuel cells, solid polymer fuel cells, molten carbonate fuel cells, phosphoric acid fuel cells, alkaline fuel cells, direct methanol fuel cells, regenerative fuel cells, and protonic ceramic fuel cells.

9. (original) The fuel cell assembly of claim 7, wherein said electrodes are selected from the group consisting of cathodes and anodes.

10. (original) The fuel cell assembly of claim 7, wherein a plurality of concavities are disposed on a surface portion of said upper serpentine channel and disposed on a surface portion of said lower channel so as to cause hydrodynamic interactions and affect the heat transfer rate between said fluid and said concavities when said fluid is disposed over said concavities.

11. (original) The fuel cell assembly of claim 10, wherein said concavities are selected from the group consisting of depressions, indentations, dimples and pits.

12. (original) The fuel cell assembly of claim 7, wherein a plurality of concavities are disposed on a surface portion of said electrodes so as to cause hydrodynamic interactions and affect the heat transfer rate between said fluid and said fuel cell when said fluid is disposed over said concavities.

13. (original) The fuel cell assembly of claim 7, wherein said fluid is selected from the group consisting of gaseous fuels and oxidants.

14. (currently amended) The fuel cell assembly of claim 7, wherein said cooling apparatus comprises one of a thin-formed metal, stainless steel, cobaltite, ceramic, $LaCrO_3$, $CoCrO_4$, ~~Inconel 600, Inconel 601, Hastelloy X, Hastelloy 230~~ an alloy comprising nickel and chromium, an alloy comprising nickel and cobalt, ~~and~~ or combinations thereof.